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ABSTRACT

Psychomotor skills need to be taught in technical education courses. Some students can be taught more easily than others, depending on their physical attributes. These attributes are speed, steadiness, perception, dexterity, agility/flexibility, endurance, equilibrium/balance, strength, and coordination. Before students attempt to learn vocational psychomotor skills, they can be assessed on each of their attributes and their competence as they attempt to learn psychomotor skills. There are four important steps in acquiring psychomotor skills: perception, motivation, imitation, and practice. Learners can go back and forth in these steps during the learning process. Vocational teachers can improve students' chances of attaining success in acquiring psychomotor skills in two particular ways: (1) The teacher can determine which attributes are required to perform the psychomotor skill and look for ways to help students increase the qualities of these attributes; and (2) The teacher should focus on the four steps of the psychomotor skill acquisition process. For example, in the first step, the teacher can use several methods of presenting the example in order to increase students' perceptions. In the second step, motivation can be increased by promoting club activities and a sense of accomplishment. The third step, imitation, can be enhanced by listing the steps in the sequence and using examples and diagrams for reinforcement. Practice, the fourth step, can be achieved by games and competition. Focusing on helping students to acquire psychomotor skills will assist the student in attaining total success. (KC)

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PSYCHOMOTOR SKILL ACQUISITION IN
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In order to put the topic into perspective, I would like to describe a psychomotor skill which I acquired recently. As a young person I learned to write in script form and we practiced the Palmer Method of writing. The letter which I learned is not in vogue now. People, especially young people like secretaries, have difficulty reading my writing because of the . So, one day I decided to use the more modern in my writing. I knew what I wanted, I had the motivation. I planned the correct strokes, and I practiced. Now, the new has completely replaced the old in my bank of skills.

In teaching we attempt to develop and transmit a mixture of cognitive information, affective values, and psychomotor skills. Sometimes we call these by other names: job skills, employability skills, knowledge, content, safety skills, appreciations, performance, entry-level skills, etc. The question arises, "Does vocational instruction really focus on psychomotor skills?" Do we teach psychomotor skills or do we expect the learner to attain them while we focus on content and attitudes?

By contrast, the services (Army, Air Corps, Navy, and Marines) focus very carefully on the psychomotor skills such as flying an airplane or firing a gun. In athletics the coaches are concerned with knowledge of plays but just look at the time spent by athletes shooting baskets, batting or throwing a ball, and running. Athletes spend years acquiring and refining psychomotor skills; they have Pee Wee baseball, Babe Ruth baseball, Junior varsity, Senior varsity, College ball, and then when an excellent athlete makes it into professional ball he must still practice! Are you convinced we do enough psychomotor skill training in the technical subjects of vocational

education?

There are some terms that we use in referring to psychomotor skills. You may be more familiar with manipulative skills, sloyd, typing skills, motor skills, job skills, perceptual-motor skills, etc. The word psychomotor does not appear in most dictionaries, but then, neither does the term motor skill. Psychomotor skills are purposeful body movements; that is, the body movement is controlled by the mind. A psychomotor skill may be as simple as winking, or as complicated as riding a bicycle.

What degree of expertness can we expect from a student? Is expertness a matter of more practice? What actually controls a person's skill level? Why are some students clumsy? Why do some students have such difficulties in performing a task? We all possess physical attributes which help determine our ability to perform psychomotor skills. These attributes are: (see Figure #1) speed, steadiness, perception, dexterity, agility/flexibility, endurance, equilibrium/balance, strength, and coordination. Attributes may be defined as the qualities or characteristics that the person needs to perform psychomotor action. All of the attributes affect the ability of the student to perform.

Speed affects the rate at which work is done. Steadiness affects such tasks as welding and pouring a casting. Perception refers to the body's ability to perceive through sight, hearing, and feeling. An example would be repairing a car fender in auto body repair. Dexterity means deftness or handiness and affects the student's use of hand tools as an example. Agility/flexibility involves the body's ability to be flexible or to bend. Consider the ability to bend your fingers to grasp some small tool. Endurance refers to the muscle's ability to sustain action. Endurance is an attribute which can be improved.

Equilibrum/balance involves the body's ability to control itself in space. There are several factors which control balance; the first is the mechanism in the inner ear, the second is sight which helps the body keep in relationship with other objects, and the third is proprioceptive feedback in which the muscles send signals to the brain indicating the position they are in at any moment. Strength is an attribute which allows the body to move agaist a resisting force. Strength, like endurance, can be increased quite easily. And, lastly, the attribute of coordination refers to the ability to move body parts in concert with each other.

Each of the attributes affects the psychomotor skill level attainable by each individual. Each attribute can be tested and then taken into account as the student attempts to learn psychomotor skills.

What is the process of learning psychomotor skills? There are four important steps to acquiring psychomotor skills; these are perception, motivation, imitation, and practice. (see Figure #2)

Perception involves seeing, or hearing about, or reading about some particular psychomotor skill being performed. The mind receives the message through symbols or action. The image is then translated and internalized. Remember my ? I saw how other people were writing it and how it looked.

The second step is motivation. The affective domain of learning enters here. The learner determines whether the task is to be learned or not or to what extent. Motivation can be intrinsic or extrinsic. Back to the ; the motivation was strictly intrinsic.

The third step is imitation. The cognitive domain functions at step three because the mind manipulates or mimics the form, pattern, sequence, or procedures necessary to complete the task. This mental manipulation may be the

weakest link in the psychomotor skill acquisition process. The mind must have in place all of the necessary steps and in the correct order. Back again to the ; which pen stroke begins the process and how is it completed?

The fourth step is the actual performance of the skill. This is usually termed practice. The psychomotor domain enters at this step. I practiced the letter at every opportunity until its use became automatic. And, the old became extinguished.

Incidentally, feedforward and feedback are an intricate part of the process and the learner can, for instance, go back from step four to step two in order to be remotivated.

How can we improve the learner's chances of attaining success in acquiring psychomotor skills?

1. Determine which attributes are required to perform the psychomotor skill. Test, at least by observation, the quality of the attribute. Look for ways to improve the quality of the attribute and have the student attempt to increase the quality.

2. Focus on the first four steps or levels of the psychomotor skill acquisition process. What part of each one can be more direct, more easily understood, more thought given to it? In the first step, use several methods of presenting the example; tell about it, show it, use a diagram. In the second step, motivation must be real; at least more than just a grade. Stusent club activities and a sense of accomplishment would help. The third step is crucial; the form, pattern, or sequence must be completely and correctly imitated by the learner. List the steps in the sequence, use examples to show the pattern, use diagrams to describe the form and procedure, lastly, repeat or explain the process several times. Practice, the fourth

level, simply provides an opportunity for the learner to use her/his attributes in learning the psychomotor skill. Lots of practice is desirable. Competition, through student club activities, provides extra practice. Take a page from the athletic notebook and have a "green & white game" or intra-class competition.

The acquisition of psychomotor skills is an important function of learning in the technical areas. It is a component of the total teaching-learning process. Focus on it and we may be able to assist the student in attaining total success.

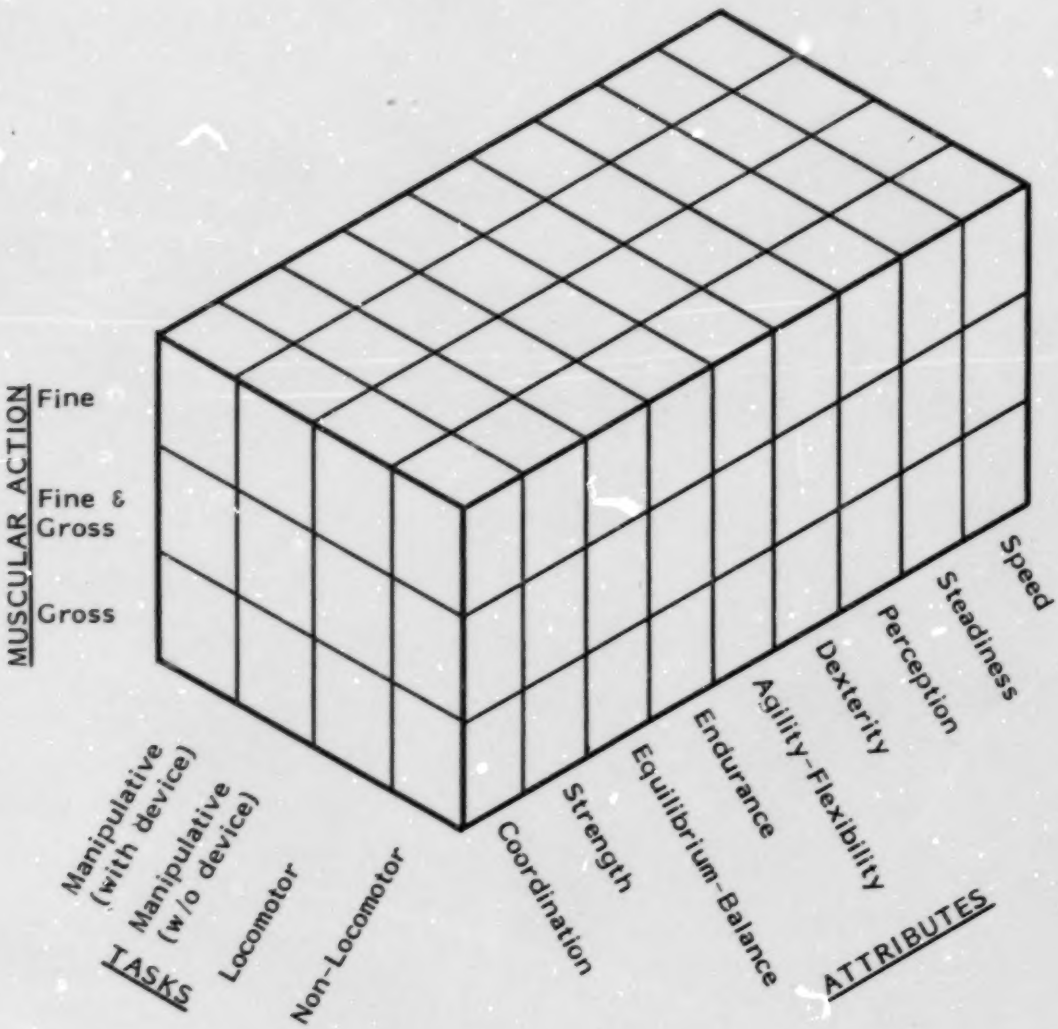

Figure 1. The conceptual model of the psychomotor domain.

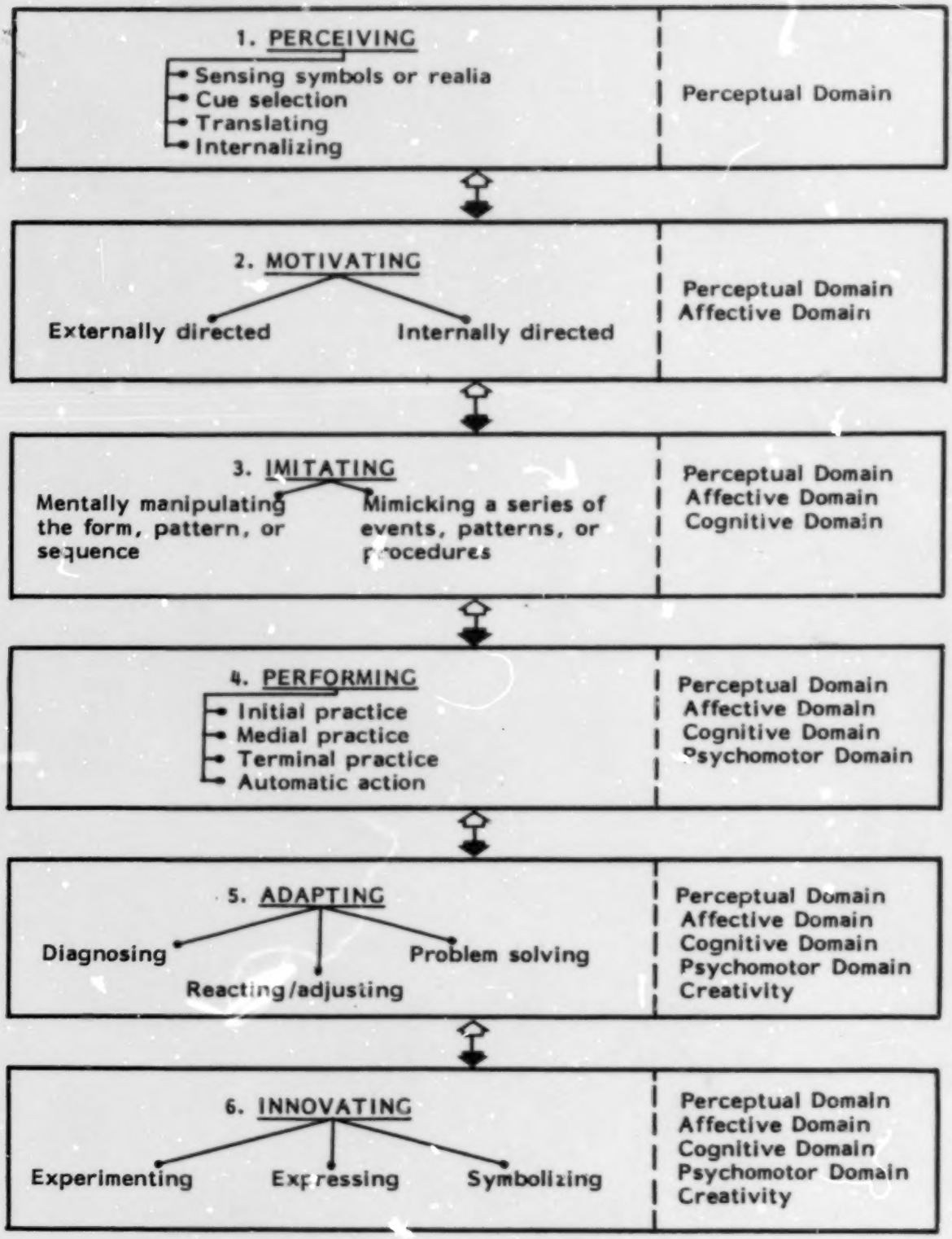

Figure #2 Acquiring psychomotor skills